INTERFERENCE PROTECTION

The Commission has allocated the Ku-band that SpaceX Services proposes to use for uplink communications (14.0-14.5 GHz) from these earth stations on a primary basis only to FSS. Certain portions of the 10.7-12.7 GHz downlink band are shared with other commercial and government services. Notably, the proposed earth stations would not transmit in these bands and will not cause any interference to other operators using those bands.

Geostationary Satellite Orbit Systems

The proposed operations will protect GSO systems from harmful interference by operating within the ITU EPFD limits that the Commission has concluded "will adequately protect GSO FSS networks."[1] Here, the applicable ITU EPFD limits are provided in Article 22 and Resolution 76 of the ITU Radio Regulations, which require the assessment of a satellite system as a whole to demonstrate that the probabilities of emissions exceeding certain levels remain within specified regulatory limits.

In SpaceX's application for a blanket authorization of high-performance user terminals, which the Commission granted in May 2022, SpaceX confirmed that its user terminal network will comply with these EPFD limits, and that such compliance was a condition of the Commission's grant of that authorization.[2] The user terminals SpaceX seeks to operate in this application will operate within the EPFD limits already authorized for that user terminal network. The Commission has found that compliance with these EPFD limits is sufficient to protect GSO systems against unacceptable interference.[3] Accordingly, the proposed operations will satisfy the GSO interference-protection requirements that the Commission has adopted for NGSO systems in this band.

In addition, the proposed ESIM operations will comply with the Commission's requirements for NGSO ESIMs in these bands to ensure that motion of the user terminal will not cause it to inadvertently exceed interference protection limits. In particular, these earth stations will be self-monitoring and, should in the unlikely event that a condition does occur that causes it to exceed EIRP, EIRP density, or off-axis EIRP mask limits included in the licensing conditions for the FSS NGSO network that it is using as a point of communication in the 14-14.5 GHz band, the terminal

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[1] *Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, 16 FCC Rcd. 4096, ¶ 77 (2000) (concluding that implementation of EPFD limits "will adequately protect GSO FSS networks"). *See also* 47 C.F.R. § 25.289 (NGSO satellite systems that comply with EPFD limits will be deemed not to cause unacceptable interference to any GSO network).

[2] *See* SpaceX Services, Inc., Radio Station Authorization, IBFS File No. SES-LIC-20220125-00081 (granted May. 16, 2022) (callsign E220009).

[3] *See, e.g., Updates to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters*, 32 FCC Rcd. 7809, ¶ 32 (2017) ("*NGSO Update Order*") ("Any NGSO FSS system operating in compliance with these [EPFD] limits is considered as having fulfilled its obligation under Article 22 of the ITU Radio Regulations not to cause unacceptable interference to any GSO network."); 47 C.F.R. § 25.289 (same).

will automatically cease transmissions within 100 milliseconds and not resume transmissions until the condition that caused the experimental terminal to exceed those limits is corrected.[4]

Fixed-Service Systems

Similar to protection for GSO systems, the ITU has adopted PFD limits (codified in Article 21 of the ITU Radio Regulations) that limit the energy of satellite downlink transmissions to protect terrestrial services. The Commission has concluded that compliance with these PFD limits is sufficient to protect terrestrial fixed-service operators from harmful interference.[5] Nothing about the operation of the proposed earth stations will affect the SpaceX system's compliance with applicable PFD limits.

NGSO Systems

The SpaceX NGSO FSS system, including operations under the authorization requested herein, will at all times comply with Section 25.261(c), which governs spectrum sharing between NGSO operators. Beyond the requirements of Section 25.261, the SpaceX system uses steerable and shapable beams as well as satellite diversity, which allows SpaceX to choose from multiple satellites capable of serving any one point on the ground. These advanced capabilities will allow SpaceX to minimize the potential for in-line events involving these or any other SpaceX earth stations.

TDRSS and Radio Astronomy

SpaceX will comply with its obligations pursuant to conditions placed on its blanket user terminal authorizations to avoid and/or coordinate with NASA TDRSS and radioastronomy facilities as necessary to avoid harmful interference to these services.[6]

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[4] *See* 47 C.F.R. § 25.228(c).

[5] *Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range*, 16 FCC Rcd. 4096, ¶ 42 (2000).

[6] 47 C.F.R. § 25.228(j) covers operation with TDRSS and Radio Astronomy. For these experimental operations, SpaceX will not operate within radio line of sight of the listed facilities unless SpaceX has coordinated its operations.